Nov. 4, 1924. 1,514,209

S. HANSEN

SPARK PLUG

Filed Aug. 26, 1922

FIG. 1.

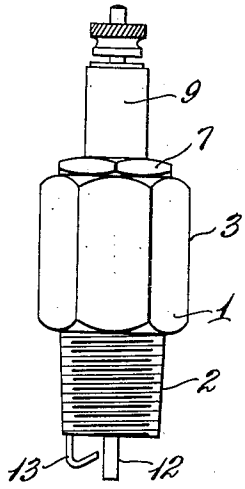


FIG. 2.

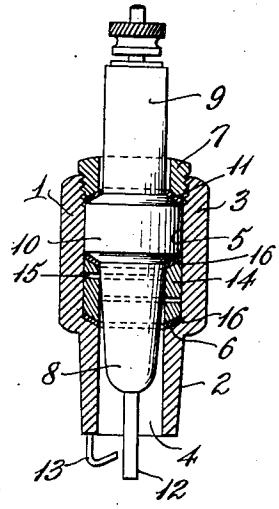


FIG. 3.

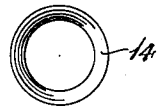


FIG. 4.

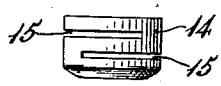
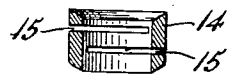


FIG. 5.



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UNITED STATES PATENT OFFICE.

SVEN HANSEN, OF CLEVELAND, OHIO.

SPARK PLUG.

Application filed August 26, 1922. Serial No. 584,486.

To all whom it may concern:

Be it known that I, SVEN HANSEN, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Spark Plugs, of which the following is a specification.

This invention relates to spark plugs, and has for its object the provision of an improved spark plug in which the liability of breakage of the porcelain insulator due to expansion and contraction of the parts is reduced to a minimum; which prevents the escape of products of combustion therefrom, particularly such as might result from the shock of the explosions within the engine cylinder; in which undue movement of the parts is readily and automatically taken up or compensated; and in which undue compression of the gaskets is avoided, thereby materially prolonging the life of said gaskets.

Further objects of the invention are in part obvious and in part will appear more in detail hereinafter.

In the drawing, which represents one suitable embodiment of the invention, Fig. 1 is an elevation; Fig. 2 is a vertical sectional view; and Figs. 3, 4 and 5 are respectively a plan, elevation and vertical sectional view of the resilient sleeve member.

Referring to the drawing, 1 represents a metal bushing or shell member having a suitably threaded cylinder engaging end portion 2 and a hexagonal head portion 3, by means of which said shell member may be secured in an opening in the engine cylinder. Said shell member is formed with a bore 4 in the cylinder engaging end portion 2 which merges into an enlarged bore or chamber 5 in the hexagonal head portion 3, forming an annular beveled shoulder 6 between said bores. The outer end of said hexagonal head portion 3 is internally threaded to receive an annular clamping nut 7 having its lower face beveled, as indicated in Fig. 2.

Suitably secured within said shell member, such as by the clamping nut 7, is a porcelain plug or insulator having its tapering end 8 extending into the bore 4 of the cylinder engaging end portion 2 and its outer cylindrical end 9 extending outwardly through the clamping nut 7. Said insulator is provided intermediate its ends with an annular enlargement or flange 10, fitting within the chamber or bore 5, and having its upper edge or shoulder beveled to correspond to the inclination of the lower face of the clamping nut 7 and its lower edge beveled to correspond to the inclination of the upper face of the resilient sleeve member, later to be described. An annular gasket 11, of any suitable yielding material, is preferably interposed between the abutting or engaging faces of the insulator flange 10 and the clamping nut 7, to more securely prevent escape or leakage of the products of combustion. Said insulator is also provided with the usual metal rod 12, the lower end of which forms one electrode of the spark plug, the other being formed by a wire 13 suitably secured in the cylinder engaging portion 2 of the shell member.

14 represents the resilient sleeve member, which may be made of any suitable resilient material, such as hardened steel, and which is adapted to surround the tapering end 8 of the insulator and seat in the lower portion of the chamber 5 within the hexagonal head portion 3 of the shell member. Said sleeve member is provided with a plurality, two being shown, of horizontally extending slots 15, cut from diametrically opposed points and each extending approximately to the opposite side of the sleeve, thereby obtaining great resiliency. Said slots may be cut at any suitable vertical distances, depending upon the degree of resiliency desired, the degree of resiliency also depending, of course, upon the number of said slots and the kind of material of which said sleeve member is made. The upper and lower faces of said sleeve member are beveled, to respectively correspond to the inclination of the lower shoulder of the annular insulator flange 10 and the annular shoulder 6 of the shell member, gaskets 16 being preferably interposed between said abutting or engaging shoulders or faces to more effectively prevent leakage past the same.

The resiliency of said sleeve member readily permits expansion and contraction of the parts, so that the liability of breakage of the porcelain insulator or other parts is negligible. Said resilient sleeve member also holds said insulator in place against the clamping nut 7, or the gasket interposed therebetween so that any undue movement of the parts, such as might result from compression of the gaskets, etc., is readily taken

up or compensated by said sleeve member. It is to be understood that the essential quality or characteristic possessed by the sleeve member 14 is that of resiliency, as opposed to a mere yielding quality, which is possessed by the annular gaskets. Leakage or escape of the products of combustion from the spark plug is also prevented.

Other objects of the invention will be apparent to those skilled in the art to which it relates.

What I claim is:—

A spark plug, comprising a shell member provided with an internal shoulder, an insulator member arranged within said shell member and provided with an external shoulder in opposed relation to the shoulder of said shell member, a cylindrical resilient sleeve member surrounding said insulator member and arranged between said opposed shoulders, said resilient sleeve member being provided with plane end surfaces and with oppositely arranged laterally extending slots, and a clamping nut for moving said insulator member into engagement with said resilient sleeve member.

In testimony whereof I hereby affix my signature.

SVEN HANSEN.